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ENVIRONMENTAL
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Explanation of Significant Differences

Explanation of Significant Differences for the Final Record of Decision for the Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13

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U.S. Department of Energy
Idaho Operations Office

Signature Sheet

Signature sheet for the *Explanation of Significant Differences for the Final Record of Decision for the Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13* at the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality.

for

L. John Iani
Regional Administrator, Region 10
U.S. Environmental Protection Agency

7/19/04
Date

Signature Sheet

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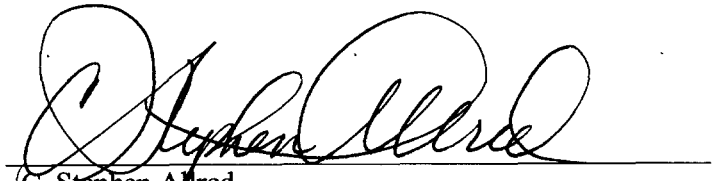

C. Stephen Allred
Director
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FEB 20, 2004
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Signature Sheet

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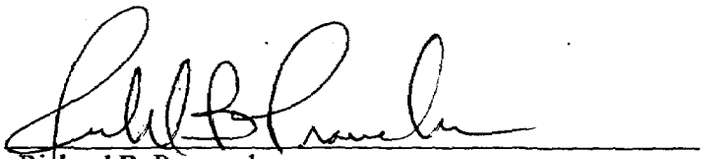

2/6/04

Richard B. Provencher
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ACRONYMS

BRA	Baseline Risk Assessment
COC	contaminant of concern
DOE	Department of Energy
EDF	Engineering Design File
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	feasibility study
HI	hazard index
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
MCL	maximum contaminant level
NE-ID	Department of Energy Idaho Operations Office
OU	operable unit
PCB	polychlorinated biphenyl
PEWE	Process Equipment Waste Evaporator
RI	remedial investigation
ROD	Record of Decision
SRPA	Snake River Plain Aquifer
PRG	preliminary remediation goal

Explanation of Significant Differences for the Final Record of Decision for the Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13

1. INTRODUCTION

This Explanation of Significant Differences (ESD) applies to the remedial actions performed under the Final Record of Decision (ROD) Idaho Nuclear Technology and Engineering Center (INTEC), Operable Unit (OU) 3-13, Idaho National Engineering and Environmental Laboratory (INEEL), Idaho Falls, Idaho (DOE-ID 1999). The ROD was signed under the Federal Facility Agreement and Consent Order (DOE-ID 1991) in October 1999 by the U.S. Department of Energy Idaho Operations Office (NE-ID); the U.S. Environmental Protection Agency (EPA), Region 10; and the Idaho Department of Health and Welfare, now identified as the Idaho Department of Environmental Quality (IDEQ). The OU 3-13 ROD divided the sites within its scope into seven specific groups, plus No Action and No Further Action sites.

The Group 5 category identified in the OU 3-13 ROD includes a final remedy to address groundwater contamination in the portion of the Snake River Plane Aquifer (SRPA) located outside the INTEC fence line. The OU 3-13 ROD deferred the selection of a remedy for groundwater inside the INTEC fence line to a new operable unit, OU 3-14. This decision was based on the uncertainty associated with the contaminant source estimates and potential releases from areas located within the INTEC fence line, including the tank farm soils (Site CPP-96) and the injection well (Site CPP-23). Among the main reasons for deferral of the final decision on the remedy for the SRPA was the uncertainty related to the contaminant source in the tank farm soils. The primary source of contamination to the groundwater originates from past discharge of contaminants through the injection well, and the deferral of this site was intended to allow further investigation of possible residual contamination. As a result of dividing the SRPA groundwater contaminant plume associated with INTEC operations into two zones, the remedial action for the SRPA is classified as an interim action. The selected interim action remedy for the SRPA is Institutional Controls with Monitoring and Contingent Remedy.

Along with Site CPP-96, Site CPP-23, and the final remedy for the SRPA, the OU 3-13 ROD also deferred three additional soil sites to OU 3-14. These include sites designated as CPP-61, CPP-81, and CPP-82. The decision to defer the three additional soil sites to OU 3-14 was based on insufficient information upon which to select a remedy for each site during the period when the OU 3-13 ROD was being developed.

This ESD, prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (42 USC §9601 et seq.) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), documents significant changes to portions of the remedies selected in the OU 3-13 ROD.

The sites and remedy changes affected by this ESD include the following:

- Sites CPP-81 and CPP-82—These sites have been further evaluated by the Agencies using existing information after issuance of the OU 3-13 ROD. Based on this evaluation, Sites CPP-81 and CPP-82 are designated as No Action sites under the OU 3-13 ROD through this ESD. The decision is consistent with the No Action decision defined in the OU 3-13 ROD, which includes sites that represent less than 1×10^{-4} risk and a hazard index (HI) of less than 1 for the potential residential scenario and thus could be available for current unrestricted use.

- Site CPP-61—This site has been further evaluated by the Agencies using existing information after the issuance of the OU 3-13 ROD. Based on this evaluation, Site CPP-61 is designated as a No Further Action site under the OU 3-13 ROD through this ESD. The decision is consistent with the No Further Action decision as defined in the OU 3-13 ROD, which includes sites that require only institutional controls to remain protective. As with other OU 3-13 No Further Action sites, CPP-61 will be subject to 5-year reviews.

- Site CPP-23 (Injection Well)—This site was further evaluated by the Agencies using both existing information and new monitoring data after the issuance of the OU 3-13 ROD. Based on this evaluation, the scope of the OU 3-13 Group 5 remedy has been expanded to include Site CPP-23 through this ESD. The expanded scope of OU 3-13 Group 5 applies to the groundwater potentially impacted by past disposals through the injection well, rather than to any direct action on the injection well itself. The revised Group 5 remedy will require additional groundwater monitoring and a modification to the steps that trigger the contingent remedy in order to address Site CPP-23. The additional groundwater monitoring will include vertical profiling of three existing wells near Site CPP-23. If vertical profiles indicate groundwater concentrations at or above 5 pCi/L of iodine-129, the modification to the steps that trigger the contingent remedy will include the possible sampling of additional nearby wells or installation of new wells, followed by fate and transport modeling. The contingent groundwater pump and treat remedy, if triggered, would remain unchanged.

This ESD and additional supporting information will become part of the INEEL administrative record. Additional supporting information includes the *Operable Unit 3-14 Remedial Investigation/Feasibility Study Additional Soil Sites Summary Report* (DOE-ID 2001) and the "INTEC Injection Well: Summary of Historical Information and Groundwater Quality Trends" (EDF-3943). The INEEL administrative record is on the Internet at http://ar.inel.gov and is available to the public at the following locations:

INEEL Technical Library	Albertsons Library
DOE Public Reading Room	Boise State University
1776 Science Center Drive	1910 University Drive
Idaho Falls, ID 83415	Boise, ID 83725
(208) 526-1185	(208) 426-1625

2. SUMMARY OF SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

This section briefly discusses the history of the INEEL, the soil sites, and the injection well; in particular, nature and extent of contamination and the various selected remedies are discussed.

2.1 Site History

The INEEL, managed by the U.S. Department of Energy (DOE), is a government facility located 51 km (32 mi) west of Idaho Falls, Idaho, occupying 2305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain. The INEEL was established in 1949 by the U.S. Atomic Energy Commission as the National Reactor Testing Station. Its purpose was to conduct nuclear energy research and related activities. It was redesignated the Idaho National Engineering Laboratory in 1974 and then the INEEL in 1997 to reflect expansion of its mission to include a broader range of engineering and environmental management activities.

The INTEC, located in the south-central area of the INEEL (Figure 1), began operations in 1952. Historically, spent nuclear fuel from defense projects was reprocessed to separate reusable uranium from spent nuclear fuel. The DOE discontinued reprocessing in 1992. Liquid waste generated from this activity is stored in an underground tank farm. Most of this liquid waste was treated using a calcining process to convert the liquid to a more stable granular form. Calcined solids are stored in stainless steel bins. Disposition of the remaining liquid waste and calcined solids is addressed in the *Idaho High-Level Waste & Facilities Disposition Final Environmental Impact Statement* (DOE 2002). The current mission for the INTEC is to receive and temporarily store spent nuclear fuel and radioactive waste for future disposition, manage waste, and perform remedial actions.

Figure 2 illustrates the locations of the three soils sites (CPP-61, CPP-81, and CPP-82) and the injection well (Site CPP-23) that are the subject of this ESD.

2.1.1 Site CPP-61

Site CPP-61 is the past location of a 25- × 25-ft oil spill contaminated with polychlorinated biphenyl (PCB), which occurred within the former CPP-718 Transformer Yard northwest of Building CPP-613 (Figure 2). The spill occurred intermittently between the spring of 1982 and December 1984, mainly during the summer months when transformer XFR-8T2-2 was operated with a voltage overload. Approximately 400 gal of mineral oil, with a PCB concentration of 179 ppm, leaked from the transformer during this time period. A temporary measure was put in place to contain the leak. However, oil that was not contained contaminated the reinforced concrete pad and soil adjacent to the pad. The transformer was drained and taken out of service in December 1984 and cleanup activities began in July 1985. Soil with a concentration of PCBs greater than 10 ppm and stained concrete were packaged and shipped off-Site for disposal. A second transformer pad was poured on August 1985 and is still present, although the transformer supported by this newer pad has since been taken out of service and removed. For more information on the history of Site CPP-61, refer to WINCO (1992a), DOE-ID (1997a), and DOE-ID (2001).

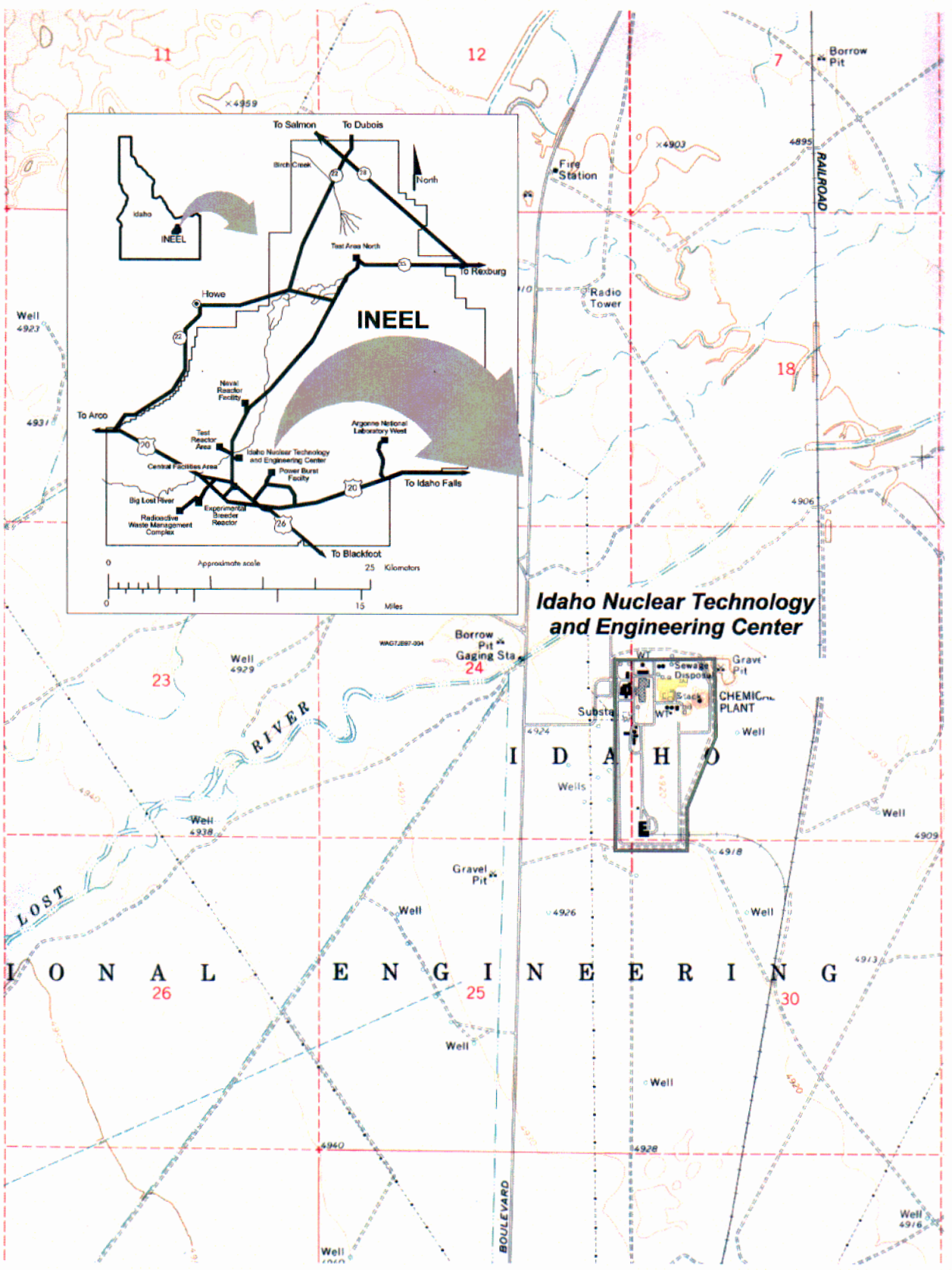

Figure 1. Location of INTEC and the INEEL.

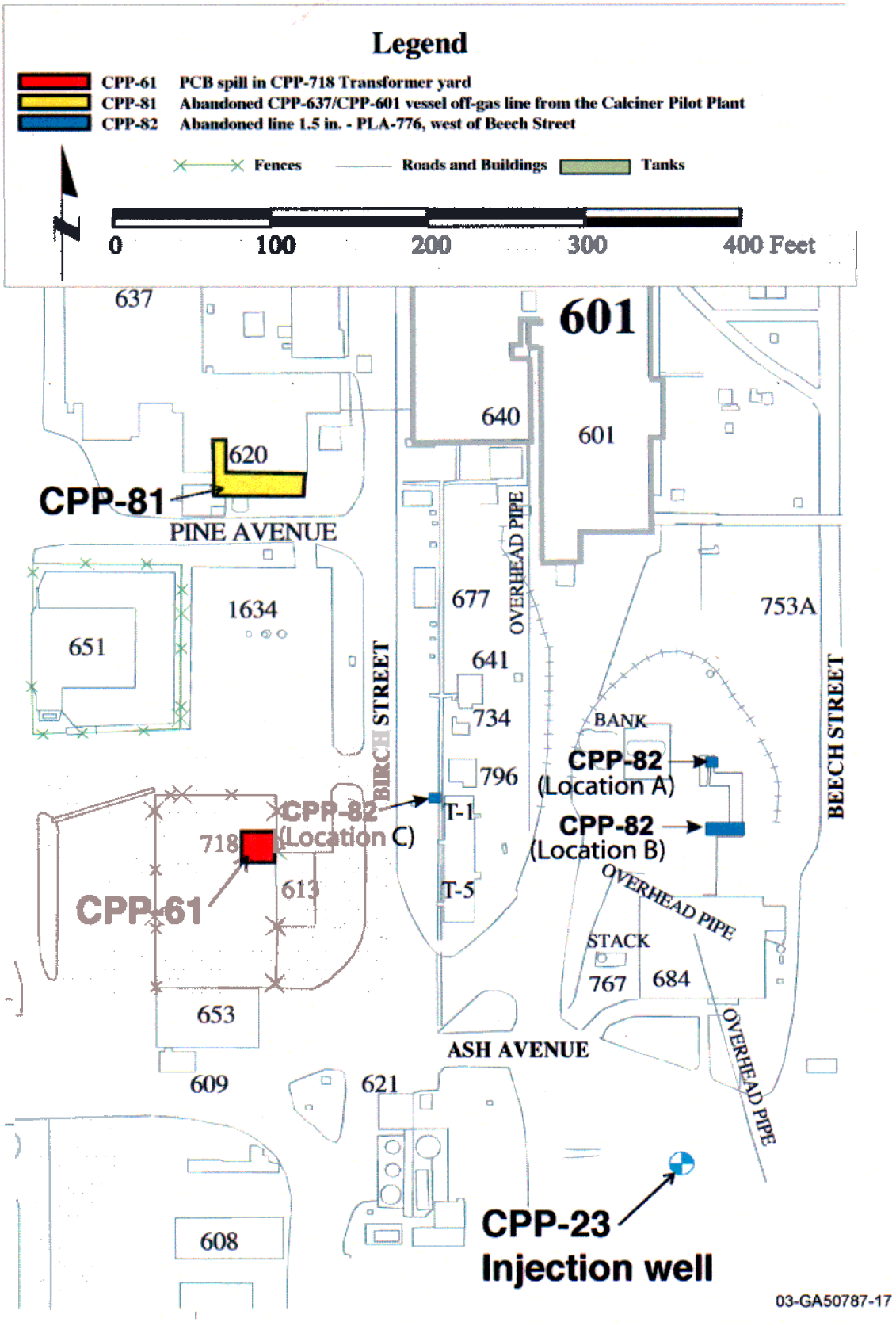

Figure 2. Location of Sites CPP-23, -61, -81, and -82.

2.1.2 Site CPP-81

Site CPP-81 is a 68-ft-long abandoned underground 3-in. vessel off-gas line that became plugged in October 1986 with simulated, nonradioactive calcine during Test Run #15 of the Calcine Pilot Plant (Figure 2). The line trends north at a depth of 2 to 3 ft below Building CPP-620, then runs east under an asphalt pad along the south side of Building CPP-620. This line was cleaned out in September 1993 as a nontime-critical removal action. After removal of the simulated calcine solids, the line was flushed with 5 nitric acid washes and 14 water rinses. The line was then capped and abandoned in place. For more information on the history of Site CPP-81, refer to WINCO (1994) and DOE-ID (2001).

2.1.3 Site CPP-82

Site CPP-82 is the location of three excavation-related buried pipeline incidents that occurred in August and September 1987 during excavation for the construction of Building CPP-797 (Figure 2). At Location A, 2.5 gal of low-level radioactive liquid waste were released from a ruptured abandoned line. All contaminated soil with radioactivity levels above background was collected and packaged for disposal as radioactive waste at the Radioactive Waste Management Complex. The line was capped and abandoned in place. Location B is the site where three of four parallel underground lines were damaged while responding to the incident at Location A. One of these lines released approximately 25 gal of nonhazardous, nonradioactive service wastewater, while no release occurred from the other lines. The damaged lines were repaired. At Location C, a backhoe ruptured two lines, one of which resulted in the release of a maximum of 500 gal of monitored blowdown water from the steam plant. The released water was determined to be nonradioactive and nonhazardous. The damaged lines at Location C were repaired. The released water was subsequently discharged to the INTEC Drainage Ditch System. For more information on the history of Site CPP-82, refer to WINCO (1992b) and DOE-ID (2001).

2.1.4 Site CPP-23 (Injection Well)

The former INTEC injection well (CPP-23) was used from 1953 to 1984 for the routine discharge of service wastewater to the Snake River Plain Aquifer (SRPA). The well received an average of 1 million gal per day of service wastewater during that period, for a total discharge volume of approximately 12 billion gal. The service wastewater comprised plant cooling water, demineralizer and boiler blowdown water, and Process Equipment Waste Evaporator (PEWE) condensates. In 1984, routine discharge to the injection well ceased and the service wastewater was then discharged to the percolation ponds located south of the INTEC facility. The injection well was used intermittently from 1984 to 1986 for the discharge of small amounts of service wastewater. All discharge to the injection well ceased in 1986.

The well was completed to a total depth of 598 ft in 1951. A 1-ft cement plug was emplaced from 597 ft to 598 ft; and 16-in. steel casing extended to 597 ft and was perforated in the intervals of 412 to 452 ft and 490 to 593 ft to facilitate fluid injection. The well was reconstructed in 1970/1971 when it was discovered that the injection well was blocked at a depth of 226 ft. This blockage allowed injected fluids to escape into the vadose zone through holes corroded in the steel casing at several depths between 102 ft and 226 ft below surface. A well reconstruction effort was then performed and a perforated polyvinyl chloride (PVC) liner was installed in 1971 to the 588-ft depth.

By 1982, the well had collapsed below a depth of 435 ft. Sand in the well was bailed out and a new, perforated polyethylene liner was installed to a depth of 560 ft. When plans were made to abandon the well in 1989, it was discovered that the well was filled with sloughed formation and well construction materials below a depth of 475 ft. The injection well was pressure-grouted with cement and abandoned in October 1989. For more information on the history of the CPP-23 injection well, refer to "INTEC

Injection Well: Summary of Historical Information and Groundwater Quality Trends" (EDF-3943). This Injection Well Engineering Design File (EDF) provides newly identified historical information and corrects certain factual errors made in the descriptions of the well in the 1997 Remedial Investigation/ Baseline Risk Assessment (RI/BRA) (DOE-ID 1997a).

2.2 Nature and Extent of Contamination

The nature and extent of contamination, as defined in the OU 3-13 ROD (DOE-ID 1999) are summarized in this section. For additional information, refer to the RI/BRA (DOE-ID 1997a), the Soil Sites Summary Report (DOE-ID 2001), and the INTEC Injection Well EDF (EDF-3943).

2.2.1 Site CPP-61

Prior to beginning cleanup activities in July 1985, the concrete pad was sampled and PCB concentrations on the pad were as high as 134 ppm. Thirty soil samples from various depths at 20 sampling locations showed that the PCB distribution in the soils was restricted to the area of the immediate spill on the east side of the pad. The maximum concentration of PCBs in the adjacent soils was 31 ppm. Adjacent to the southeast corner of the concrete pad, PCB concentrations were 5.2 ppm and 4 ppm at depths of 72 in. and 78 in., respectively. The cleanup involved removal and disposal of the hollow concrete transformer pad foundation and removal of PCB-contaminated gravel and dirt, including soil located between the walls of the hollow concrete foundation, under the concrete pad. Soils with concentrations of PCBs in excess of 10 ppm, including soils from under the concrete pad, were removed and packaged. The maximum depth of excavation was 6 ft below the land surface. Forty 55-gal drums of PCB-contaminated soil and debris and the intact concrete pad were disposed of off the INEEL. Soils with concentrations of PCBs less than 10 ppm were used as backfill material.

Before the 1985 removal of soil associated with the PCB release, surface radioactive contamination was noted. As part of the Waste Area Group 3 RI/BRA (DOE-ID 1997a) field program, four borings were completed at Site CPP-61. Radiological constituents were detected in the surficial sample from each boring, but at low activity levels. Activity levels decreased to below background concentrations at shallow depths, except for Tc-99 in one boring. The maximum value for Cs-137 (2.5 pCi/g) is near the risk-based screening level of 2.3 pCi/g that was used in the RI/BRA but is well below the remedial goal of 23.3 pCi/g Cs-137 that was established in the OU 3-13 ROD. Because of the limited extent of soil with radioactivity levels above background, Site CPP-61 was considered a site of negligible soil contamination and was qualitatively evaluated in the BRA.

2.2.2 Site CPP-81

Simulated calcine in the abandoned line, originating from Test Run #15, contained cadmium and chromium. Other substances potentially present in the line from previous test runs included zirconium, calcium, chloride, fluoride, potassium, sodium nitrate, sulfate, aluminum, boron, mercury, lead, hexone, tributylphosphate, AMSCO, U-238, U-235, cobalt, strontium, cesium, and cerium as nonradioactive nitrates. The line was flushed with 5 nitric acid washes and 14 water rinses over a 30-hour period. The initial acid wash had concentrations of cadmium and chromium at 465 ppm and 190 ppm, respectively, with final water rinse concentrations of 0.17 ppm for cadmium and 0.11 for chromium. No leaks were observed during the removal action. No solids were observed, via remote camera inspection, in the line during the postremoval inspection. The line was capped and abandoned in place.

2.2.3 Site CPP-82

The release at Location A was contained within the excavation hole, and the broken line was excavated 10 ft beyond the hole. Soils with activities above background radiation levels were collected and disposed of at the Radioactive Waste Management Complex. Contaminants included Cs-137, Sr-90, and I-129, with cadmium and trichloroethylene (TCE) possibly present based on process knowledge. (The Track 1 Decision Document [WINCO 1992b] included mercury in the risk analysis, although no sources were identified for mercury.) The ruptured line at Location B carried nonhazardous, nonradioactive service wastewater. Soil impacted by the release was not removed. The release site at Location C was surveyed and did not reveal radioactive contamination. Historical analytical data relevant to the Location C release indicate no concentrations of hazardous constituents above site-specific risk-based screening levels (DOE-ID 1997a).

2.2.4 Site CPP-23 (Injection Well)

The service wastewater discharged to the injection well contained primarily radionuclides, with the major radionuclides of concern being tritium, Sr-90, Cs-137, and I-129. The RI/BRA (DOE-ID 1997a) reported the total activity of each of these radionuclides known to have been disposed of in the injection well during the period that records are available: H-3 (21,300 Ci), Sr-90 (16.0 Ci), Cs-137 (20.5 Ci), and I-129 (0.278 Ci), based on limited disposal records. The wastewater also contained minor amounts of various other chemical constituents. Organic constituents were an insignificant component of the service waste. However, the service waste stream carries the F001, F002, F005, and U134 EPA hazardous waste codes through the "derived from" rule because the service waste stream included PEWE condensates, which contained the listed waste types, based on limited analytical data and knowledge of the processes that contributed to the service waste stream. The service waste stream that was discharged to the injection well contained insignificant concentrations of suspended solids.

Graphs of the total monthly discharge to the service waste stream and the injection well show that the rate of discharge of the various radionuclides varied significantly from month to month and year to year (EDF-3943). Numerous pulses of tritium, Sr-90, and I-129 occurred, over time, in the service waste stream. These pulses are believed to represent batches or slugs of PEWE condensate that were mixed with a much larger volumetric flow of the service waste stream.

The injection well was evaluated as a possible continuing source of contamination for the SRPA (EDF-3943). Information on the nature and extent of contamination in perched water and the SRPA can be found in the RI/BRA (DOE-ID 1997a), the FS (DOE-ID 1997b), and the FS Supplement (DOE-ID 1998a). The contaminant concentrations and distributions in perched water and in the SRPA are important in evaluating the injection well itself as a possible source of residual contamination.

Due to its long half-life and low drinking water maximum contaminant level (MCL) of 1.0 pCi/L, I-129 is of special concern for groundwater impacted by fluids discharged through the injection well. For the purposes of groundwater modeling in the RI/BRA (DOE-ID 1997a), the FS (DOE-ID 1997b), and the FS Supplement (DOE-ID 1998a), it was estimated that a total of 1.39 Ci of I-129 were disposed of in the injection well over its lifetime. The Injection Well EDF (EDF-3943) concludes that a maximum of 0.86 Ci of I-129 were disposed of in the injection well, based on analysis of disposal and facility operating records. This lower number is considered a more realistic estimate of the total amount of I-129 disposed of in the injection well.

2.3 Proposed Remedies in the OU 3-13 Proposed Plan and Site Reassignment to OU 3-14 in Accordance with the 1999 OU 3-13 Record of Decision

As indicated above, these four sites were deferred from the OU 3-13 ROD to the new OU 3-14. All were included in the OU 3-13 Proposed Plan (DOE-ID 1998b), but the decision to defer these sites to OU 3-14 was made during the development of the OU 3-13 ROD.

2.3.1 Site CPP-61

Site CPP-61 was previously evaluated in a Track 1 Decision Document (WINCO 1992a). No further action was recommended with respect to PCBs after PCB-contaminated soils were excavated in the 1985 removal action. In addition, the Track 1 Decision Document recommended evaluation of radioactive contamination noted during the removal action. The site was reevaluated in the 1997 RI/BRA (DOE-ID 1997a) to address the radioactive contamination. Based on the Track 1 and the RI/BRA risk-based evaluation of radioactive contamination, Site CPP-61 was identified as a "No Further Action" site in the OU 3-13 Proposed Plan (DOE-ID 1998b). However, the Agencies transferred this site to OU 3-14 via the OU 3-13 ROD (DOE-ID 1999) for further evaluation due to uncertainty over the possible presence of PCB contamination under the newer existing concrete pad. The documents available at that time did not clearly indicate if the soils under the newer concrete pad had been excavated in the 1985 removal action.

2.3.2 Site CPP-81

Site CPP-81 was previously evaluated in a Track 1 Decision Document (WINCO 1994) and was identified as a "No Action" site in the OU 3-13 Proposed Plan (DOE-ID 1998b). However, the Agencies transferred this site to OU 3-14 via the OU 3-13 ROD (DOE-ID 1999) citing insufficient data to make a final decision. Specifically, the uncertainty regarded the presence, if any, of residual trace compounds in the abandoned line. Process data indicated that trace compounds, such as mercury, might have existed in the line and such compounds had not been analyzed in samples of the final water rinse.

2.3.3 Site CPP-82

Site CPP-82 was previously evaluated in a Track 1 Decision Document (WINCO 1992b) and was identified as a "No Action" site in the OU 3-13 Proposed Plan (DOE-ID 1998b). However, the Agencies transferred this site to OU 3-14 via the OU 3-13 ROD (DOE-ID 1999), citing insufficient data to make a final decision. The uncertainty centered on potential residual contaminants that were not addressed in the Track 1 Decision Document and that the Agencies feared may be present, based on process knowledge.

2.3.4 Site CPP-23 (Injection Well)

The OU 3-13 ROD identified the injection well as the primary INTEC-related source of contamination in the SRPA. As such, groundwater contaminated by past discharges into the injection well was included in the ROD in Group 5, Snake River Plain Aquifer. An interim action remedy was selected for the SRPA in the 1999 ROD but did not include specific action on the injection well itself. The selected remedy was considered a final action for the portion of the SRPA located outside of the INTEC security fence line and an interim action for the portion of the SRPA located inside the INTEC security fence line. The evaluation and final remedy selection for the SRPA inside the INTEC security fence were deferred to the OU 3-14 ROD primarily to allow further examination of the impacts of near-surface contaminant releases associated with the tank farm on the SRPA. Uncertainties in the source term at the

tank farm and uncertainty in the soil-water partition coefficient (K_d) for plutonium were among the main reasons for deferral of the final decision on the remedy for the SRPA to the OU 3-14 ROD. The injection well, which is located inside the INTEC security fence line, was included in the SRPA scope deferred to the OU 3-14 ROD. This deferral was intended to allow further investigation of the possible presence of a residual contaminant source in the injection well. Remediation, if necessary, of any residual contamination associated with the former injection well was deferred to the OU 3-14 ROD.

The SRPA interim action remedy, Institutional Controls with Monitoring and Contingent Remediation, as defined in the OU 3-13 ROD, includes

- Maintaining existing and additional institutional controls over the area of the SRPA contaminant plume to prevent exposure to contaminated groundwater during the time the aquifer is expected to remain above MCLs

- Groundwater monitoring to determine if SRPA groundwater contaminant of concern (COC) concentrations exceed their action levels and if the impacted portion of the aquifer is capable of producing more than 0.5 gpm, which is considered the minimum drinking water yield necessary for the aquifer to serve as a drinking water supply

- Contingent active pump and treat remediation if the action levels are exceeded and production is greater than 0.5 gpm such that the modeled aquifer water quality will exceed the MCLs after 2095 in the SRPA outside the current INTEC security fence.

3. DESCRIPTIONS AND BASIS OF THE SIGNIFICANT DIFFERENCES

Archived information and previous reports for Sites CPP-61, CPP-81, and CPP-82 were further evaluated and reported in the *OU 3-14 Remedial Investigation/Feasibility Study Additional Soil Sites Summary Report* (DOE-ID 2001).

Additional analytical data from monitoring of the SRPA have been obtained since the OU 3-13 ROD (DOE-ID 1999) was issued. This new information was compiled and analyzed, together with historical data, in the "INTEC Injection Well: Summary of Historical Information and Groundwater Quality Trends" (EDF-3943). In addition, that document describes the history of the injection well, including reconstruction efforts and the waste discharge characteristics, based on a thorough review of archived files. The most recent groundwater monitoring data are presented in *Monitoring Report/Decision Summary for Operable Unit 3-13, Group 5, Snake River Plain Aquifer* (DOE-ID 2004).

3.1 Site CPP-61

The information presented in the *OU 3-14 Remedial Investigation/Feasibility Study Additional Soil Sites Summary Report* (DOE-ID 2001) supports a determination of "No Further Action" for Site CPP-61. The site was deferred to OU 3-14 in the OU 3-13 ROD because it was not clear if soil contaminated with PCBs had been removed from under the original concrete transformer base. Further examination of the records of the previous soil removal demonstrated that soil under the base had indeed been removed. The highest observed residual radionuclide concentration (2.5 pCi/g Cs-137) is below the OU 3-13 remediation goal of 23.3 pCi/g Cs-137 (future residential) and near the 2.3 pCi/g Cs-137 for current unrestricted use. With respect to PCBs, the site was cleaned up to less than 10 ppm, which was the cleanup level established in the site-specific cleanup guideline. The PCB-contaminated soil had been excavated to a depth of approximately 6 ft. One borehole sample from a depth of greater than 6 ft showed a concentration of 4.0 ppm, based on a 1985 soil sample. The backfill is assumed to contain PCBs in concentrations of less than 1 ppm. Based on screening level preliminary remediation goals (PRGs), the observed residual soil PCB concentrations pose a carcinogenic risk of less than 10^{-4} (based on a residential land use scenario). The associated hazard index (HI) is less than one, based on PRGs, except for the single sample containing 4.0 ppm PCBs. This single reading is not considered representative of the residual source remaining at the site. Site CPP-61 will be maintained as a **No Further Action** site, with required institutional controls and 5-year reviews.

This information eliminates the uncertainty that had been present at the time of the 1999 ROD (DOE-ID 1999) over the possible existence of a remaining source of contamination. Table 1 summarizes changes for this site.

Table 1. Summary of changes for Site CPP-61.

Remedial Action Element	Original Remedy	Remedy Change
Site CPP-61	**Further evaluation** necessary for making a final decision. Site transferred to OU 3-14 for further evaluation.	**Further evaluation has been com**pleted. Retain in the OU 3-13 ROD as **No Further Action** site. Maintain institutional controls in accordance with the Institutional Control Plan developed under OU 3-13. Maintain institutional controls and conduct 5-year reviews. The purpose of the institutional controls for Site CPP-61 is to provide non-engineered restrictions on activities, access, or exposure to soil contaminants.

3.2 Site CPP-81

The information presented in the *OU 3-14 Remedial Investigation/Feasibility Study Additional Soil Sites Summary Report* (DOE-ID 2001) supports previous determinations of "No Action" for Site CPP-81. After further evaluation, it was determined that, due to the rigorous nature of the multiple nitric acid washes and through better understanding of the pilot plant processes, trace compounds would not be present in the interior of the line at levels of concern. This site qualifies as a **No Action** site because there is no remaining source in the line, so the risk is therefore below 10^{-4} and the HI is <1.

This information eliminates the uncertainty that had been present at the time of the 1999 ROD (DOE-ID 1999) over the possible existence of a remaining source of contamination in the abandoned line. Table 2 summarizes changes for this site.

Table 2. Summary of changes for Site CPP-81.

Remedial Action Element	Original Remedy	Remedy Change
Site CPP-81	Additional information required for making a final determination. Site transferred to OU 3-14 for further evaluation.	Further evaluation has been completed. Retain in the OU 3-13 ROD as **No Action** site.

3.3 Site CPP-82

The information presented in the *OU 3-14 Remedial Investigation/Feasibility Study Additional Soil Sites Summary Report* (DOE-ID 2001) supports the previous determinations of "No Action" for Site CPP-82. Three excavation-related buried pipeline incidents occurred during excavation for construction of Building CPP-797. Location A involved rupture of abandoned line and release of 2.5 gal of low-level radioactive liquid waste. This site was previously cleaned up to background radiation levels. Locations B and C involved minor releases of nonradioactive, nonhazardous waste water. Based on a careful review of existing data, there is no remaining source in the soil, so the risk is therefore below 10^{-4} and the HI is <1. This site qualifies as a **No Action** site per the OU 3-13 ROD definition of **No Action**. No source of contamination remains at Site CPP-82. This information eliminates the uncertainty that had been present at the time of the 1999 ROD (DOE-ID 1999) over the possible existence of a remaining contamination source. Table 3 summarizes changes for this site.

Table 3. Summary of changes for Site CPP-82.

Remedial Action Element	Original Remedy	Remedy Change
Site CPP-82	Additional information required to make a decision. Transferred to OU 3-14 for further evaluation.	Further evaluation has been completed. Retain in the OU 3-13 ROD as **No Action** site.

3.4 Site CPP-23 (Injection Well)

Evaluation of new and existing information associated with the injection well, including monitoring of contaminants in the SRPA and perched water since the issuance of the OU 3-13 ROD, has provided sufficient information to expand the Group 5 remedy in the OU 3-13 ROD to encompass

Site CPP-23 through this ESD. Supporting information is documented in the Injection Well EDF (EDF-3943), the *Annual INTEC Water Monitoring Report for Group 4-Perched Water* (DOE-ID 2003a) and the *Monitoring Report/Decision Summary for Operable Unit 3-13, Group 5, Snake River Plain Aquifer* (DOE-ID 2004). Table 4 summarizes the changes for this site. The estimated cost increase over the OU 3-13 ROD from implementation of the remedy change is $73,000.

Table 4. Summary of changes for Site CPP-23 (injection well).

Remedial Action Element	Original Remedy	Remedy Change
OU 3-13 Group 5	OU 3-13 Group 5 Interim Remedy Institutional Controls with Monitoring and Contingent Remediation.	OU 3-13 Group 5 Interim Remedy Institutional Controls with Monitoring and Contingent Remediation with scope modified to address Site CPP-23.
Institutional Controls	Maintain existing and additional institutional controls over the area of the SRPA contaminant plume including area access restrictions; land use restrictions; notice to affected stakeholders; warning signs, locks, and labels on wells screened in the SRPA.	Unchanged.
Groundwater Monitoring	Sample new and existing wells for SRPA intervals of highest contamination with specific monitoring described in a post-ROD monitoring plan. Packer test of wells USGS-41, USGS-48, and USGS-59 below the HI interbed was performed under this plan.	In addition to the sampling requirements in the original remedy, perform vertical profiling of groundwater in three monitoring wells (USGS-44, USGS-46, and USGS-47) every 5 years to monitor concentrations of I-129 in the aquifer resulting from the former injection well. Vertical profiling will be performed using a straddle packer sampling system at a minimum of five discrete depths in each well.
	Compare packer test results to SRPA remediation goals listed in Table 8-2 of the OU 3-13 ROD. These action levels require that MCLs be met in the SRPA outside the INTEC fence in 2095.	In place of the action levels identified in the original remedy, an action level of 5 pCi/L I-129 (five times the I-129 MCL of 1 pCi/L) is established for vertical profiling of the three monitoring wells (USGS-44, USGS-46, and USGS-47). If I-129 vertical profiles indicate groundwater I-129 concentrations below 5 pCi/L, groundwater monitoring will continue for these three wells under the Group 5 Long-Term Monitoring Plan. (DOE-ID 2003b)

Table 4. (continued).

Remedial Action Element	Original Remedy	Remedy Change
Contingent Remediation Trigger	If action levels are exceeded and isopleth maps indicate that hot spot(s) volumes will pose unacceptable risk, determine if areas of the SRPA produce 0.5 gpm for 24 hours of pumping. If so, the contingent pump and treat remedy will be implemented.	If I-129 vertical profiles in monitoring wells USGS-44, -46, and -47 indicate groundwater concentrations at or above 5 pCi/L, steps will be required to address CPP-23 that differ from the steps required for other areas of the aquifer as described in the original remedy. Sampling of other monitoring wells in the vicinity of CPP-23 may be required. Installation of new monitoring wells may also be required. Fate and transport modeling will be performed to predict year 2095 groundwater concentrations. If the modeling predicts that the 2095 groundwater concentrations will exceed the SRPA remediation goals established in the OU 3-13 ROD, the contingent pump and treat remedy will be initiated.
Contingent Remedy	Pump and treat remedy will include treatability studies, followed by (1) installation of wells to remove the zone of maximum contamination, (2) aboveground physical/chemical treatment of extracted water, and (3) on-site recharge to the SRPA or evaporation of treated effluent.	Unchanged.

One of the Agency concerns regarding the injection well is the possible presence of residual contamination within or adjacent to the injection well. The history of the injection well reveals a pattern of well collapse, infilling with formation and well construction materials, and reconstruction. The archived information clarifies that the materials removed from the well during the two major reconstruction events consisted of formation and well construction materials, not sludge originating from injected fluids. Based on the operational history of the former injection well and the low suspended solids content of the service waste, there is no indication that sludge ever accumulated in the well. When plans were made to close the well in 1989, it was discovered that the well was filled with sloughed formation and well construction materials below a depth of 475 ft. The injection well was pressure-grouted with cement and abandoned in 1989. The sloughed materials were not removed prior to grouting. Based on the evaluation of the archived history of the injection well, the solid materials currently remaining at depth in the abandoned well are not composed of sludge or residual contaminant mass that would cause MCLs to be exceeded in the SRPA in the year 2095 and beyond.

New groundwater quality data were compared with historical data in the Injection Well EDF (EDF-3943). Additional monitoring data from the *Annual INTEC Water Monitoring Report for Group 4-Perched Water* (DOE-ID 2003a) and the *Monitoring Report/Decision Summary for Operable Unit 3-13, Group 5, Snake River Plain Aquifer* (DOE-ID 2004) were also evaluated. The data were

reviewed to assess if the relevant remedial action objective from the OU 3-13 ROD would be achieved by 2095. That remedial action objective is to ensure that SRPA groundwater does not exceed a cumulative carcinogenic risk level of 1×10^{-4}; a total Hazard Index of 1; or applicable State of Idaho groundwater quality standards (MCLs) by 2095. Concentration trend plots for the key COCs for the SRPA are presented in the EDF. The groundwater monitoring results collected to date demonstrate that

- Tritium activities have declined below the drinking water MCL (20,000 pCi/L) in all nearby SRPA downgradient monitor wells but remain slightly above the MCL in a few perched water wells within the INTEC security fence.

- Sr-90 activities in some SRPA monitor wells downgradient of the former injection well remain above the MCL (8 pCi/L). These concentrations are predicted to drop below the MCL before the year 2095. Sources of Sr-90 in the SRPA include both the injection well and near-surface sources, such as the contaminated soils at the tank farm. The distribution of Sr-90 in perched water strongly suggests that the primary source of Sr-90 to the SRPA is not the former injection well but, rather, the tank farm soils. Sr-90 activities in perched water monitor wells closest to the former injection well are at or below the MCL, but some perched water monitor wells close to the tank farm contain very high Sr-90 activities. In addition, the perched water monitor wells with the highest observed Sr-90 activities are screened in the shallowest perched water, which was not impacted by releases from the former injection well.

- I-129 activities have declined below the drinking water MCL (1 pCi/L) in all nearby SRPA monitor wells and in all but one (MW-33-2, with 1.29 $\pm$0.16 pCi/L I-129) of the nearby perched water wells.

The *Monitoring Report/Decision Summary for Operable Unit 3-13, Group 5, Snake River Plain Aquifer* (DOE-ID 2004) strengthens the evidence of the lack of a residual contaminant source in the injection well. During July-August 2003, groundwater samples were collected below the HI interbed using an inflatable packer at monitor wells USGS-41, USGS-48, and USGS-59. Iodine-129 concentrations in groundwater from beneath the HI interbed were less than the MCL (1.0 pCi/L) in all of the wells. Among the three wells, USGS-48 showed the highest I-129 activity (0.25 $\pm$0.05 pCi/L). USGS-48 is located approximately 950 ft downgradient of the former injection well. The observation that the I-129 concentration in groundwater beneath the HI interbed in this well is currently less than 50% of the MCL provides strong evidence that no significant residual deep source of I-129 exists at the former injection well. Furthermore, tritium and Tc-99 activities were likewise far below their MCLs in each of the wells (20,000 pCi/L and 900 pCi/L, respectively). The highest tritium activity observed was 2,080 pCi/L (USGS-48), and the highest Tc-99 activity was 36.9 pCi/L (USGS-59). The only COC that exceeded the MCL below the HI interbed was Sr-90. Sr-90 activities were slightly above the MCL (8 pCi/L) in each of the three wells, with the highest Sr-90 activity reported for USGS-59 (9.91 $\pm$1.49 pCi/L). However, Sr-90 concentrations in groundwater at and downgradient of INTEC have been steadily declining and are predicted to decline below the MCL long before the year 2095. The HI interbed is less than 5 ft thick in the vicinity of the former injection well. However, it should be noted that the injection well was completed to a total depth of 598 ft; therefore, the bottom of the injection well was approximately 75 ft below the HI interbed.

Because USGS-48 was sampled on April 10, 2003, during the Group 5 annual monitoring event, it is useful to compare the results for the sample collected on that date from the entire open interval of the well (462-743 ft bgs) with those for the sample collected August 6, 2003, from the deeper portion of the well below the HI interbed (558-743 ft bgs). Concentrations of tritium, Sr-90, Tc-99, I-129, and gross alpha/beta in the groundwater sample from below the HI interbed were significantly lower for each of these radionuclides than concentrations in the sample collected from the entire open interval. In general,

the activities of these radionuclides in the deep groundwater sample were approximately half those observed in the bulk groundwater sample collected from USGS-48. This indicates that the highest concentrations of each of these radionuclides in USGS-48 are present in the shallow portion of the aquifer above the HI interbed. Again, this supports the conclusion that there is no "deep residual source" of contaminants at the former injection well.

In this consideration of perched water and groundwater data, it is important to note that one of the remedial action objectives for the SRPA, as established in the OU 3-13 ROD, is to ensure that the SRPA groundwater does not exceed CERCLA risk levels or applicable groundwater quality standards (MCLs) in the year 2095 and beyond. For perched water, one of the remedial action objectives is to prevent migration of radionuclides in concentrations that would cause the SRPA groundwater to exceed CERCLA risk levels or applicable groundwater quality standards (MCLs) in the year 2095 and beyond. There is no commitment, in the OU 3-13 ROD, to meet MCLs in the perched water itself.

In summary, tritium and I-129 activities are currently below their respective MCLs in the SRPA downgradient of the injection well at and near the INTEC facility, and no significant residual source of tritium or I-129 appears to exist at or near the injection well. Sr-90 activities in the SRPA currently exceed the MCL, but the tank farm and perched water, rather than the injection well, appear to be the residual sources of Sr-90 to the SRPA. These separate sources will be addressed in the OU 3-14 RI/FS and ROD.

One source of uncertainty in the consideration of the injection well as a residual source of contamination is possible dilution effects resulting from sample collection in monitor wells with long open intervals. Depth-specific groundwater samples were recently collected in four borings located downgradient of the INTEC facility at depths above, within, and below the HI sedimentary interbed to address this uncertainty. None of the depth-specific groundwater samples collected from wells downgradient of the INTEC facility contained I-129 activities that exceed the drinking water MCL. These data are summarized in the *Monitoring Report/Decision Summary for Operable Unit 3-13, Group 5, Snake River Plain Aquifer* (DOE-ID 2004). Based on this source of uncertainty, additional vertical profiling has been added to the expanded OU 3-13 Group 5 remedy as it applies to the injection well.

A second source of uncertainty derives from the distance between the monitoring wells and the injection wells and the possibility that groundwater between these wells and the injection well may contain elevated concentrations of the contaminants of concern. Vertical profiling data have not been collected from the closest existing monitor well located downgradient to the injection well (USGS-47). Based on this uncertainty, additional vertical profiling of three SRPA monitor wells closest to the former injection well (USGS-44, -46, -47) is included in the expanded OU 3-13 Group 5 remedy.

A third source of uncertainty is the possible past disposal of organic compounds in the injection well. While it is possible that organic compounds were inadvertently discharged to the well upon occasion, there is no evidence that the well was ever used for the routine disposal of organic compounds. During the injection well closure in 1989, groundwater samples were collected from the INTEC water supply wells and nearby monitor wells. No organic compounds were detected, and all volatile organic compounds were below the 10-μg/L reporting limit.

The Injection Well EDF (EDF-3943) examined available volatile organic compound analytical results for groundwater at and near the INTEC facility. Trace concentrations of 1,1,1-trichloroethane (TCA) have occasionally been detected in groundwater and perched water, but the observed concentrations are more than 100-fold below the drinking water MCLs. Based on process knowledge and groundwater monitoring results, there is no evidence of any significant historical or existing source of volatile organic compounds in the vadose zone or groundwater near the former injection well.

The evidence presented above, and provided in greater detail in the Injection Well EDF (EDF-3943), indicates that although COCs are present in the vadose zone and aquifer underlying INTEC, the injection well itself is not likely to be a continuing, residual source of contamination to the SRPA that would cause MCLs to be exceeded in the year 2095 and beyond. However, the uncertainty associated with this conclusion has led to the identification, in this ESD, of groundwater monitoring tasks intended to address the uncertainty.

4. AGENCY COMMENTS

EPA and the IDEQ have reviewed this ESD and the supporting documentation and agree with these changes to the selected remedies for Sites CPP-61, CPP-81, and CPP-82.

EPA and IDEQ initially disagreed with the remedy proposed for Site CPP-23 by NE-ID in the draft ESD. As a result of negotiations between the NE-ID, EPA, and IDEQ regarding the draft ESD, an expansion of the OU 3-13 Group 5 remedy to encompass CPP-23, as described in this ESD, was determined to be mutually acceptable. The application of the OU 3-13 Group 5 remedy to CPP-23 was clarified through the addition of specific monitoring requirements and criteria for triggering further contingent investigations and other actions.

5. PUBLIC PARTICIPATION

The INEEL will publish a notice of availability and a brief description of this ESD in the local newspaper (the Idaho Falls, Idaho, *Post Register*) and at least six other Idaho newspapers. The INEEL Community Relations Office may be contacted at (208) 526-4700 or 1-800-708-2680. This meets the requirements in 40 CFR 300.435(c)(2)(i), "Community Relations."

6. AFFIRMATION OF THE STATUTORY DETERMINATIONS

After reviewing the proposed changes to the selected remedies, NE-ID, EPA, and IDEQ believe the remedies remain protective of human health and the environment, comply with federal and state requirements identified in the ROD as applicable or relevant and appropriate to these remedial actions at the time of the original ROD, and are cost-effective. In addition, permanent solutions and alternative treatment technologies are included in the revised remedy to the maximum practicable extent. For Sites CPP-81 and -82, the determination that no contaminant source remains and, therefore, that no exposure is possible makes the No Action remedy a permanent solution. For Site CPP-61, the remaining residual source at depth will require institutional controls for the remedy of No Further Action to be permanent. The Site CPP-23 is included in the expanded scope of the OU 3-13 selected remedy for Group 5 (SRPA) (Institutional Controls with Monitoring and Contingent Remediation). If vertical profiling and groundwater modeling trigger initiation of the contingent remedy, a permanent solution is provided by removing groundwater from the zone of maximum concentration. If this contingency is triggered, the use of alternative treatment technologies will be evaluated in treatability studies. The modified remedies satisfy the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund) (42 USC §9601 et seq.).

7. REFERENCES

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